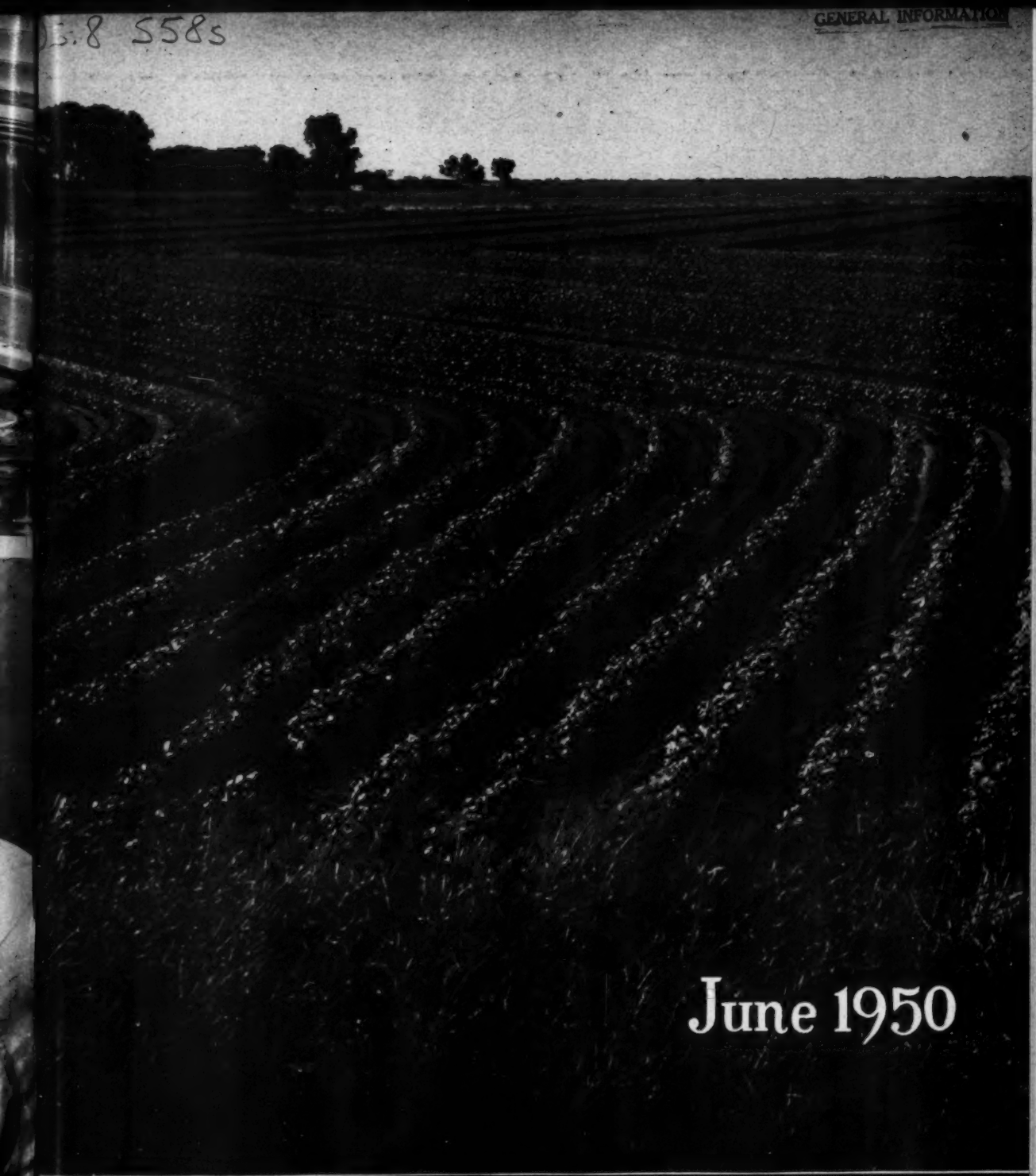

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☆ THIS MONTH ☆

WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

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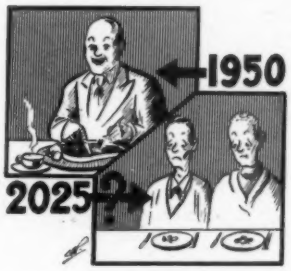

SCHOOL ADMINISTRATOR LOOKS AHEAD.—Willard E. Goslin, Pasadena, Calif., superintendent of schools, before the National Association of Secondary School Principals at Kansas City, Mo., advocated a school in which conservation, democracy, and peace will have top attention. "By 2025," he said, "about two Americans will be where one is now. If something isn't done, they are going to have a hard time eating." He told fellow educators, "You and I will be able to live out our lives, in the main, in a land of plenty, but unless you folks stir yourselves and realize the importance of emphasizing conservation, there will be more hungry people in the American generation to come than can produce the kind of citizens we must have to survive."

FRONT COVER.—This is how border irrigation of cotton is seen on the farm of Henry Derham of the Toyah-Limpia Soil Conservation District, Balmorhea, Tex. Borders have very slight slope, with sideslopes removed. Photo by Ben Osborn.

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DISTRICT PROFILE

DAVIS of TEXAS

When the National Association of Soil Conservation Districts picked Waters S. Davis, Jr., of Texas as its 1950 president, it turned its steering wheel over to a man who believes the salvation of agriculture lies in soil conservation as carried on through soil conservation districts.

For the past 6 years, whenever he has been able to get a listener, Waters Davis has talked conservation of soil resources and good land management. Using the land for the use to which it is best suited is a part of his creed. Giving it the treatment it needs and operating it in a way to keep it permanently useful is the rest of it.

He believes the only way to get permanent soil and water conservation on the land is through the democratically organized and operated soil conservation districts. By doing the job through the districts, Davis is convinced that the responsibility for conserving the land is where it should be—in the hands of the landowners and operators themselves.

To Davis, as to many other livestockmen, putting the land to its best use is certain to mean a lot of good pasture. In most parts of the country that means grass, and Davis is convinced that some of the Nation's agricultural problems would be much less troublesome if a few million acres of land now growing poor crops were put in good grass.

Not long ago when a fat steer that had eaten $700 worth of sack-feed won top prize money in a Texas stock show, Davis blew his top. The Texas livestock industry, he argued, was missing a bet when it failed to encourage better recognition of the State's most important crop—grass. Davis decided that it was time for Texas youth to begin learning about grass and that one way to start was for the Association of Texas Soil Conservation District Supervisors, of which he is president, to sponsor grass-judging contests at local fairs and at all the big stock shows. The idea caught on and has spread rapidly to other States.

Waters Davis got his first taste of soil conservation district work in 1944 when he volunteered to run for district supervisor "because I felt sorry for the fellow who asked me after he'd been turned down by nine other men."

Waters S. Davis, Jr.

Davis was elected, but if you'd told him then that 6 years later he would head the National Association, be president-manager of the Texas association, editor of the association's *Texas Topsoil*, chairman of the Brazoria-Galveston Soil Conservation District Board of Supervisors, and a member of a dozen or so other agricultural organizations, he probably would have cracked, "Bud, you've got a loose connection somewhere."

Besides his official duties in soil conservation district organizations, which require him to travel widely and take an increasing amount of his time, Davis could probably win the prize for cooperating with the largest number of districts as a landowner. He is an active cooperator with the Brazoria-Galveston, McLennan County, Wichita-Brazos, and Lower Trinity Soil Conservation Districts.

Davis is mighty proud of the way his own cattle have progressed since he started to improve the grasses on his range land. The calf crop on his

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League City ranch, his home and headquarters, topped the market at Houston five times in a row, and calves on his Waco ranch improved from a 70-percent crop and 425-pound weights in 1944 to 91.6 percent and 535 pounds in 1948.

Waters Davis was born at Galveston in 1899. He graduated from Hotchkiss School, Lakeville, Conn., and Williams College, Williamstown, Mass. "My major was German literature, so help me," he quips.

He lived in the east until 1940, but was interested in Texas agriculture all this time and made frequent visits to his home State. He took over the League City ranch in 1940 when he returned to his native State to live.

Telling how he got into soil conservation district work 4 years later, Davis relates: "Back in the spring of 1944, I came out of the barnyard the wrong way. I should have gone out around the back and taken a 20-mile detour to the house. It would have been time and energy saved. Walking toward me was a very innocent looking gent, Morris Vieman, the Galveston county agent. 'Waters,' says he, with an air of handing me a piece of candy or a fresh plug of Tinsley's Thick, 'this Brazoria-Galveston Soil Conservation District has been voted through and it needs a good man to run for supervisor.' "

That was the beginning of Davis' work for soil conservation districts which has seen him elected to top jobs in the national, State, and local organizations.

And though he says roughly that "I don't want to be midwife to any more soil conservation districts," his friends know that Waters Davis recognizes the importance of his job and will stick to it as long as there is soil conservation work to be done.

—Tarleton A. Jenkins.

AWARDS FOR GOOD DISTRICT ADMINISTRATION

An outstanding example of industry cooperation with soil conservation district governing bodies is the annual project sponsored by the Goodyear Tire & Rubber Co. to encourage good district administration.

This is the third consecutive year in the States of Illinois, Indiana, Iowa, Michigan, Missouri, Minnesota, Ohio, and Wisconsin.

The current contest runs from July 1, 1949, to June 30, 1950. Each State's winning district governing body, together with the district's three outstanding farmers, will be taken on a 7-day vacation trip to the company's farms at Litchfield Park, Ariz.

The award trip will be packed with recreation, sightseeing, and companionship with farmers from other States. Three days will be spent at the farms. A complete cowboy outfit—shirt, pants, and a "10-gallon hat"—will be issued to each guest to get him into the true "western spirit." All the luxuries of the Wigwam, an outstanding winter resort, will be included: Golf, swimming, rodeos, and desert tours; inspection of methods pertaining to growing cotton, raising range cattle, irrigation, and other activities in Arizona's Salt River Valley.

The score sheet used by the districts to judge their own activities is divided into four main parts:

1. Administration.
2. Speeding present and future work.
3. Conservation planning.
4. Conservation accomplishments on the land.

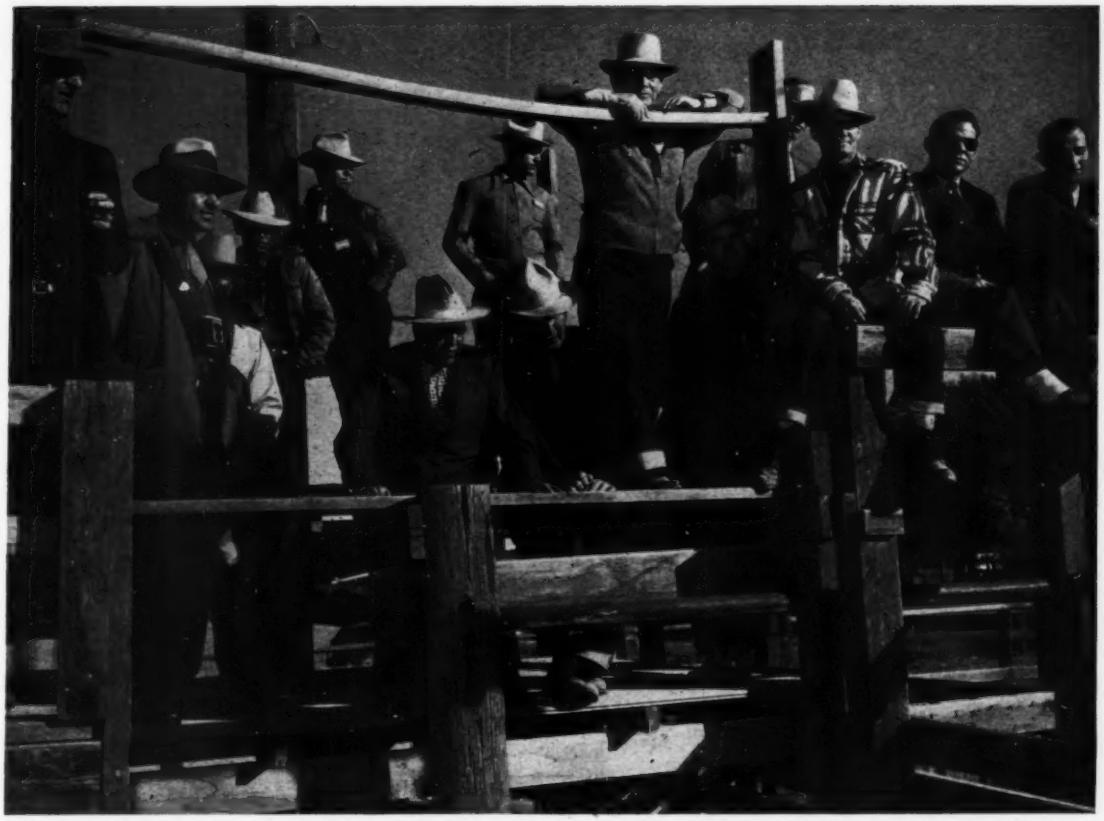
At the close of the program, the districts will submit the score sheet to a State judging committee appointed by the State conservation committee. This committee completes the job by scoring the districts on the following:

5. Program development and plan of undertaking.

6. Additional factors. Judges use this section as they see fit to compensate for such factors as difference in personnel assisting the district, equipment available, etc.

This year an aid has been added for use in selecting a district's three outstanding farmers. The "accomplishment sheet" enables farmers and cooperators to judge their own efforts during the year.

There has been a big increase in the number of



Shown watching a rodeo in Arizona in 1948 are these farmers and district officers who were among the winners that year. Hands on rail, in center, is P. W. Litchfield, board chairman of the sponsoring company.

participating districts as a result of this accomplishment sheet.

The score sheet supplies to the districts a guide to carry on their daily task of management. It helps to develop a strong organization, able to direct proper land management and the correct application of soil conservation methods.

During August and September, Goodyear will hold a series of recognition luncheons in centrally located cities in each of the eight States honoring winning districts and farmers.

Cooperating in the program are district governing bodies, the Extension Service, the Soil Conservation Service, and the State judging committees.

WILD-TURKEY PASTURE.—Even wild turkeys relish Suiter's grass (Kentucky 31 fescue) pasture, says John B. Hungerford, SCS technician of Waycross, Ga.

Early in January, when Hungerford and Simon Krock were walking over Sapelo Island, they saw 28 wild turkeys grazing on a newly established fescue-white clover pasture. They investigated.

No cattle had access to the pasture, yet it was grazed heavily. The white clover had been passed over. The turkeys preferred fescue.

The two men learned that the flock of turkeys had grazed the fescue pasture for more than a month, feeding on it almost every day. The birds had grazed an adjoining field of oats lightly and only for very short periods, obviously preferring the fescue.

Aware of the possibility of using fescue for wildlife pasture on low-lying lands, Verne Davison, SCS biologist, had several observational fescue plantings made exclusively for wildlife—deer, wild ducks, wild geese, and wild turkeys. Davison explained that the best way to find out if the perennial wetland-loving grass is suitable for wildlife forage is to try it out and see.

A second planting, recommended by Davison for winter wild-turkey pasturage, was being used by the turkeys daily through December and January. Kit Shaffer, Virginia Game Commission technician, reports this encouraging use of Kentucky fescue on their game food pastures in the Cumberland State Forest, located in central Virginia.

THIS FARM POND STOPPED A FIRE

By WELLINGTON BRINK

MOUNT Prospect Farm, which lies a little north of Travilah, Md., in the Potomac hunt country, is famed as a fine demonstration of soil conservation operations. Owned by William C. Hanson, a refugee from city life, it has been visited by hundreds of farmers, students, agricultural experts, and even a 40-car contingent from a branch of the United Nations. Hanson, who taught school camouflaged in sideburns at the tender age of 17, has enjoyed greatly the educational accomplishments of his 400 green acres in spreading the doctrine of soil conservation as achieved through careful technical planning by the Soil Conservation Service, cooperation under the Montgomery Soil Conservation District, and intelligent application of modern farming methods.

What Hanson did not reckon on, however, was a realistic demonstration of the fire-insurance value of his farm pond, a pond which is his particular pride and joy and the first to be constructed under a 1,000-pond program now well advanced in the State of Maryland. A blue jewel of esthetic, recreational, and stock-watering values, it occupies a logical site down the slope between house and highway. It was constructed in 1946 at a cost of $1,000 through cooperation of the Soil Conservation Service, the Maryland Game and Inland Fish Commission, the Montgomery Soil Conservation District, and the Montgomery County Board of Education. Many a school boy picked up some needed wages and some even more-needed soil conservation knowledge in its making. Its completion was heralded by the planting of 500 bream and 50 large-mouth bass in its waters. Hugh Bennett, America's conservation chief, poured in the first can of fish. Also present were Ed Davis, State soil conservationist; Eugene Walker, chairman of the district; Malcolm King, State wildlife field supervisor; Marion B. Fussell, district conservationist; Henry C. Dulany, conservation aid and O. W. Anderson, county agent.

Three springs feed the pond and enable it to store 1,500,000 gallons of water. As a matter of fact, the springs came to life, flowed more generously, after Hanson installed his all-pasture program. The pond is 9 feet deep at its deepest and is so constructed with overflow pipes that even a cloudburst could do no damage. "The area roundabout is seeded to provide cover for wildlife, and the water will be available if ever a fire should break out on the Hanson farm," observed one newspaper man.

Flames under control. (Photo by Malcolm King.)

Fire protection was indeed an important consideration. William Hanson never in his life had been a victim of fire, but fire was his one great fear in connection with his large farm investment. With some of his savings from his business career, he had built a 12-room house, a $15,000 barn, stables, machinery and tool sheds, all architecturally harmonious and attractive. Hanson slept better after he had the pond.

For 3 years and more after the pond was built life on Mount Prospect Farm was as nearly idyllic as this "retired" businessman could wish. His cattle fattened and thrived—on pasture. He showed the champion carload of feeder steers at the Baltimore livestock show, also the champion load of Berkshire barrows. Twice the pond's convenient waters saved neighboring houses from destruction by enabling volunteer fire companies from Silver Spring and Rockville to refill their tanks quickly.

The farm is regular host to the Marlboro, Warrenton, Middleburg, and Orange County hunts. And it was on George Washington's Birthday, this year, that pink-coated members of the Potomac hunt were involved in even more excitement than they bargained for. A little before noon they had gone through all the rituals, including the stirrup cup, and then cast their hounds. The hounds were in full pursuit of a large red fox when Hanson looked back from a rise in ground and saw

smoke pouring from the top of his barn. As word of the fire reached the rest of the riders, they abandoned the chase and hurried back to aid. By that time, one by one, the animals had been led from the burning building. Within 15 minutes, Gaithersburg-Washington Grove and Rockville volunteer firemen arrived, laid their hose lines, established two pumpers down by the pond 1,100 feet away, and began throwing 5-inch streams of water on the flames. In a few minutes the fire was under control. Hanson's tractor with its manure loader rapidly removed the smoldering bales of hay, and on these and smoking embers firemen played water for some hours.

"It was the first time," said Hanson, "that these fire companies had had plenty of water to work with and a chance to try out their new equipment."

Notwithstanding damage of $10,000—amply insured, another $20,000 worth of barn and adjacent buildings, together with equipment, was saved by the pond. Thus it was that Hanson topped off his long series of demonstrations by showing to a large audience exactly what he meant when he talked of a farm pond for fire protection.

When William Hanson purchased his 400 rolling acres in 1942 the marks of the plow were apparent. Only 8 acres were in grass and even these had been destined for cultivation. Hanson fenced his property well. Then he put all but 80 acres of timber in pasture. He bore down heavily on Ladino clover, orchardgrass, Kansas brome, alfalfa, lime, manure, superphosphate, and 0–14–7 fertilizer. He filled the gullies with brush, manure, and straw, and smoothed them over. He gave his woods that well-cared-for, managed look, had them marked for thinning and began to get from them a substantial annual revenue. He worked according to a soil conservation plan developed by SCS technicians. Today, his white home on its green carpet constitutes a well-groomed estate known far and wide as a showplace. And in the pond are good-sized bass and bream waiting to challenge his skill as a fisherman.

Farm ponds have many advantages and a great many farmers want them. Hugh Bennett says to his SCS farm planners: "Don't overlook farm ponds. They are good for conserving water and water is necessary for farm stock of all kinds. They come in handy, too, for spraying purposes, irrigating gardens, and putting out fires. Farm ponds afford good fishing, boating, and swimming, and when you have one you can tell where your youngsters are, and your neighbors' youngsters, on Saturday and Sunday afternoons.

"Tell farmers about them. I haven't yet seen any farmers who don't like their ponds. The Service has put in more than 50,000 already. They help make fishermen out of nonfishermen, and that too is of importance. I have never seen a fisherman who isn't a fine fellow and good citizen."

Saving the day at Mount Prospect Farm. (Photo by Malcolm King.)

Grass Magic IN NORTHEASTERN COLORADO

By JIM WILSON

FARMERS on the sandy soil in the northeastern corner of Colorado knew they had to do something about their land or soon they wouldn't have any. It was the best dry land in the State for Great Plains moisture conditions. Even in drought years when the wheat on the "hard land" burned up, the sandy land produced crops. But it was going to pieces—fast! For 50 years they had corned and wheated it continuously—churning the loose ground, taking off without putting back, breaking down the fertility and tilth of the soil till only the bare bones remained on many fields. Now the wind was even taking the bones, scooping out blow-outs, piling up dunes, raining dead sand on the good land that was left. At first they hadn't known they were murdering their farms, but they knew it now!

They weren't "suitcase farmers." They had a lot of money invested in permanent improvements and a lot of heart and soul invested in their way of life. They'd put down roots and built a community based on lasting, wholesome human values. They couldn't see it swept away.

Wally Bruce, the new district conservationist, believed in that kind of community. "Boys," he said, "I've just been down to the SCS grass nursery at Albuquerque. You wouldn't believe what these new planted grasses will do on run-down dry land"—and he told them what he had seen.

They didn't believe, but Rex Meakins, north of Hextun in Phillips County, was willing to try a few acres of crested wheat. He sowed it in bare, unprotected blow-sand. Whipped to death by the wind, it failed. "Let's try it again, in cane stubble," Wally urged. This time it grew. Soon farmers were coming from 20 miles around to see it.

That was in 1943. Today, in the four counties of Logan, Phillips, Sedgwick, and Yuma, there are more than 30,000 acres of crested wheat, tall wheat, and intermediate wheatgrass, sand lovegrass, bromegrass, Russian wild rye, and other planted grasses. Farmers of the area call their corner of Colorado the grass reseeding capital of the United States.

Many farmers who tried Wally Bruce's idea skeptically are now making more money per acre from grass than they ever made from cultivated crops on the same land, and making it easier.

Mike Gretch, of Sedgwick County, had always been a corn farmer, putting his land to wheat every third or fourth year to give it a rest from cultivation and keep it from blowing away. It was a losing game. He couldn't use barnyard manure to maintain the fertility—on dry land it competes with crops for scarce moisture and often makes them burn up. As the fertility of his land declined, the yield of plant refuse—straw and stalks—dwindled till it was hardly worth working back into the soil. Thus the break-down continued at an even faster pace. Year after year the corn yield declined. Cornstalk wheat didn't even pay expenses any more, but he had to keep raising it. He didn't dare cultivate the land every year.

In 1943 Mike started planting grass. It took him 4 years to learn the game and get a full stand of crested wheat on the first 20 acres—but he stuck to it. Year before last he sowed crested wheat in cane stubble on a barren, sandy 3-acre hilltop that had never produced more than 3 bushels of corn or 2 bushels of wheat to the acre. The next year he harvested 300 pounds of seed from this patch, after pasturing it 6 weeks! This was more return in one season than he had got from this land in the last 17 years altogether.

On his 560-acre place Mike has 30 acres of crested wheat, 140 acres of native grass, and

NOTE.—Reprinted by permission of Ford Farming, Dearborn, Mich.

smaller plots of sand lovegrass, intermediate wheat and tall wheatgrass, which he plans to enlarge to provide balanced pasture throughout the season. The crested wheat comes on early in the spring, followed in turn by the tall wheat, the intermediate wheat, and the native grass, which is at its best in June and early July. By late summer, when these are all brown and sere, the sand lovegrass is booming along, green and succulent. It lasts till fall, when the crested wheat greens up again.

The wealth of rich green forage bursting from Mike's "worn-out" fields still looks like a miracle to him. How do these amazing little seeds from central Asia and elsewhere unlock the life in seemingly dead land? What makes them yield up to four and five times as much forage as the native short grass? He doesn't know, and neither do I. He just knows that the Soil Conservation Service has canceled the death sentence that hung over his farm—that while his cattle are getting fat on the protein-rich growth, the dense, penetrating roots are anchoring the sand and turning it back into soil. Wheat and corn allotment cuts don't worry him. He's cutting every year, voluntarily.

Northeastern Colorado farmers are learning ways to help grass help *them*. Last spring, after planting and fertilizing his corn with nitrogen and phosphate—commercial fertilizer works on dry land where manure fails—Mike cleaned out his fertilizer boxes in a corner of his crested wheat patch. The grass grew twice as rank there! This spring he's fertilizing all his grass.

Bill Oliver of Phillips County plants sweetclover with his crested wheat, besides fertilizing it with commercial nitrogen and phosphate. His records show that this grassland averages about 40 percent more profit per acre than the land in wheat and corn. He has one 16-acre field of crested wheat seeded in the spring of '45. The second year, after pasturing 11 cows on it from April 1 to May 20, he harvested 400 pounds of seed per acre, then pastured it again from September 15 to November 18. "The seed crop alone," he says, "brought more than twice as much as the average crop for the five preceding crop years."

The next year he pastured it all season. Last year he pastured it 5 weeks in the spring, harvested 10,000 pounds of seed, and pastured it 2 months in the fall! Recently, after 3 months of wind, with almost no rain or snow, he wrote me, "It sure looks good. The immense root system and thick turf defy wind and drought."

Although two reseeding enthusiasts, Harvey Harris of Sterling, and Frank Sparks of Fleming, have planted over 2,000 acres apiece, most of the grass acreage in northeastern Colorado is in comparatively small plots on many farms. The aim of the Soil Conservation Service has been, first, to dot the area with hundreds of local sources of seed; second, to show farmers how grass fits into an integrated, diversified farm plan; third, to heal the scattered "open sores"—the blow-outs, dunes, and go-back patches—as quickly as possible.

The tractor owned by the Haxtun Soil Conservation District since 1943 has seeded thousands of acres in small plots for large-scale farmers who find their own equipment too big and cumbersome for grass farming.

When a farmer finds how profitable his few acres of grass are, he is sure to plant more. In 1944 Henry Lambert borrowed the district tractor and planted 8 acres of mixed sandgrasses on a barren blow-hill where the sand was so loose he couldn't use his own equipment. By the second year, the stand was so well established that he began grazing it—the first return he had ever got from the land. "That convinced me," he told me. "I put out more grass every year after that—sand love, intermediate wheat, crested wheat and tall wheat. My intermediate wheatgrass made 175 pounds of seed to the acre last year. It's worth a dollar a pound, but I'm planting it all back on my own land this spring. I've got a fourth of my farm in grass now."

Gordy Knode, north of Haxtun, in the light sand, has seeded 180 of his 320 acres to sand lovegrass, Lincoln brome, crested wheat, intermediate wheat, stiff-haired wheat and tall wheatgrass, planting it with commercial fertilizer and sweetclover. "The clover supplies nitrogen to make strong, healthy grass," he says, "and after 5 or 6 years I figure the grass will have put enough 'binder' back into the sand so I can plow it up again."

However, Wayne Chaney, of Haxtun, also planned to plow up his crested wheat after 5 years, but when he figured the per-acre beef yield, he decided to leave it and plant intermediate wheat and sand lovegrass besides. Max Fulscher, of Amherst, a "hard land" wheat farmer, says the patch of crested wheat he planted 13 years ago as an experiment is still the most profitable piece of

ground on his place. He pastures purebred Herefords on his winter wheat, then tides them over on crested wheat till the native grass comes on.

These farmers are finding that grass pays off in other ways besides pasture, hay, seed, and improved soil. There's a wonderful stand of bindweed on the railroad right-of-way through T. A. Norton's farm near Peetz! To keep it from spreading into his fields he corralled it by planting a strip of crested wheat on each side. The crested wheat is spreading into the bindweed! (Western Nebraska farmers say crested wheat will absolutely kill out bindweed.)

Frank Sparks, who has 2,200 acres of crested wheat, intermediate wheat, Russian wild rye, Lincoln brome, and sand lovegrass, drilled a 65-acre patch that was "absolutely solid with cockleburs" to crested wheat in August 1944. It got a good rain, all came up—and crowded out the cockleburs the first year. Frank uses his crested wheat as a "hospital pasture" for sick cattle and those that have gone through the winter on dry feed and are suffering from malnutrition. "They pick up right away," he says. Early-growth crested wheat is so rich in protein, phosphorus, and vitamin A (carotene) that some feed companies cut and dehydrate it. The dehydrated grass, with 20 percent protein, is almost a concentrate!

Crested wheat was the pioneer planted grass in northeastern Colorado and it is still the most popular, with more acreage than all others combined—mainly because farmers believe it to be the most drought-resistant of all. But the newer grasses are catching on fast. Each has its points. Intermediate wheatgrass, though less hardy and drought-resistant than crested wheat seems to yield almost twice as much forage. Tall wheatgrass is best for alkali soil, and looks promising for sand. Ernie Sonnenberg of Sterling says that, although tall wheatgrass *looks* coarse and unpalatable, his cattle prefer it to all other grasses in August. A neighbor says *his* cattle eat the new stiff-haired wheatgrass like candy. Sand lovegrass is uniquely adapted to sand—does well even on pure blow-sand—and keeps growing when other grasses are dormant. Brome, the top grass farther east, uses too much nitrogen to plant alone on light soils, but many farmers are sowing it successfully in established stands of the new Stafford "dry land" alfalfa developed by Clarence Stafford of Haigler, Nebr.

All these grasses are palatable and high in protein, and all fit into the picture. If you plan to go into grass, your soil conservationist or county agent can work out a sequence for you that will provide continuous pasture from about April 1 through to January. It's best to plant the different grasses in separately fenced plots and graze them in rotation. Cattle on a mixed pasture tend to concentrate on the grass they like best and graze it to death.

You can plant grass any time from September to April when moisture conditions are good. Don't plant after April—the seedlings will die in the mid-summer heat. Early fall plantings germinate soon and are well established by winter, but may die if moisture is short. Late fall and winter plantings germinate after the snows and spring rains. Plant sand lovegrass early enough to go through a hard freeze to crack the hull—otherwise it may not germinate. Some dealers pre-freeze the seed to make sure.

If you don't have a grass drill, says Wally Bruce, a grain drill will do. When planting mainly for seed, northeastern Colorado farmers plug some of the spouts and plant in rows far enough apart to cultivate. For pasture and hay, regular drilled stands are best. Seeding rates and depths depend on the size of the seeds and type of land. See your conservationist for details.

Grass needs a firmly packed seedbed and the tiny seedlings need protection from blowing soil. Many hard-land farmers summer-till, pack the ground, and sow by September 15 (earlier, if there's moisture) with a thin stand of oats. The oats keeps the soil from blowing till the grass gets started, then winter-kills and doesn't compete for moisture in the spring. Sandy-land farmers north of Haxtun plow deep early in spring, drill sorghum in June, and sow grass (preferably with sweetclover and fertilizer) in the stubble in fall.

"However you plant," says Wally, "don't plow up your field in disgust too soon! It may take a year, even 2 years, for all the seed to sprout. One farmer planted his field three times without getting a stand—he thought! It *all* came up the third year.

"At first you'll see only a few tiny spears in the midst of the weeds. The next year there's a stand. Soon you're wondering how to keep it from getting too thick."

To keep sand lovegrass from crowding itself, Rolly Broughton leaves the straw on the ground

(*Continued on p. 261*)

INCOME RISES AS THE FARM MENDS

By W. M. NIXON

SOME folks are likely to grumble a little when it comes time to pay Federal income taxes. But not Gerhard Koehler who has a 166-acre farm in the Middle Guadalupe Basin Soil Conservation District near Yoakum, Tex. He pays cheerfully.

Koehler points out that paying income taxes means that his farm is on the mend, its soil improving, and the place increasing in value. It means that he himself is getting more revenue from his farm, that he can take better care of his family. He's glad to let Uncle Sam have a share of what the farm earns.

About 10 years ago Koehler's farm was in a bad way. The topsoil was eroded and depleted. Crops of poor quality were getting skimpier. It was taking more and harder work all the time to get any production at all. Then Koehler went to his soil conservation district supervisors for help. The supervisors approved his application and asked Soil Conservation Service technical men to work with him in developing a well-rounded conservation plan that fitted his farm, and in getting it put on his land.

Conservation plans began to take shape in 1942. That year Koehler figured his income at $1,521.57. As in previous years of low farm production, there was no income tax to pay that year. Next year, however, as his conservation practices began to show measurable results, income was up to $3,043.08, and Koehler proudly paid the Government which had been helping him $7.74 in income tax. Koehler felt especially proud of his income tax payment for 1946. It was $134.73. Income that year was $3,815.44. Income for 1947 and 1948 was well over the $4,000 mark. It had increased more than 186 percent since his farm began recovering its lost productivity through his soil conservation work.

In Koehler's system of soil conservation measures, guar looms large. He has kept records to show the value of this legume, a relatively new conservation crop that helps protect the land and condition the soil. For example:

Koehler planted 6 acres to guar on May 25, 1948, using 10 pounds of seed and 300 pounds of super-

Note.—The author is regional agronomist, Soil Conservation Service, Fort Worth, Tex.

phosphate to the acre. The 6 acres had previously been in grain sorghum. Koehler ran out of fertilizer so that half an acre received no phosphate. He cultivated the guar twice and harvested seed late in November, getting 1,375 pounds of seed by combine despite rainy weather. After the seed harvest, he went over the area with a stalk cutter to make a mulch of the guar residue. Late in December he flatbroke the field and in January 1949 disk-harrowed the land and laid it off in rows. The first week in March he planted corn.

On adjoining land of the same kind of soil that had been treated with neither guar nor phosphate, Koehler harvested 16 bushels of corn an acre. The half acre that had the benefit of guar but not of phosphate produced corn at the rate of 34 bushels an acre. On the rest of the 6 acres planted to guar and fertilized with phosphate, the yield was 49 bushels an acre.

It's easy to understand why Koehler has taken a fancy to guar as a crop that helps to protect his soil against erosion and build up its fertility. Of the 1,375 pounds of seed he harvested from his 6 acres, he sold 1,000 pounds to other farmers cooperating with the Middle Guadalupe Basin Soil Conservation District, and used the rest to increase his own planting to 25 acres.

Guar, however, is only a part of Koehler's well-rounded system. He uses other crops that help to prevent erosion and increase productivity. His cropland is cultivated on the contour to keep the soil from washing down slopes. Terraces and diversions carry excess rain safely off and around his cultivated fields. On his pasture lands he mows to keep weeds under control and he otherwise encourages the growth and spread of good forage grasses by keeping the number of his beef and dairy cattle small enough to avert overgrazing.

Gerhard Koehler and son inspect seed pods of soil-improving guar, a plant now expanded to cover 25 acres.

Harry Koehler, Gerhard Koehler, and Troy Berry, SCS technician, compare size and quality of corn. The baskets represent relative yields. The big full ear Koehler holds came from soil conditioned by guar and fertilized with phosphate; yield averaged 49 bushels of high-quality corn. The smaller ear Harry holds came from soil conditioned by guar but not treated with phosphate; yield ran 34 bushels per acre. The small, partly filled nubbin in Berry's hand came from adjoining soil of same type but unbenefited by either guar or fertilizer; the area yielded 16 bushels of inferior corn per acre.

Because of the work he has done in soil conservation, Koehler was awarded a plaque last year in the *Fort Worth Press* "Save the Soil and Save Texas" awards program. He had been judged the year's best conservation farmer in his soil conservation district. He is helped in running the farm by his son Harry, World War II veteran, who is studying farm-equipment mechanics.

Koehler not only applies conservation measures to his own place; he also talks conservation to his fellow farmers and uses his farm as a sort of laboratory where they can come and see the results of the practices he adopts to keep his soil in place and build up its productiveness, like the plot he set up on November 8, 1945:

On one part of the plot he planted annual yellow-blossom clover, using 10 pounds of seed and 400 pounds of superphosphate an acre. On the other part he didn't plant clover or apply phosphate. In the spring of 1946 he seeded the whole plot to cotton.

On August 9 a group of fellow farmers came to see what was happening. They saw that where no clover had been grown or phosphate applied, the cotton was dying from root rot. Plant growth and color were poor. Where the plot had been conditioned with clover and fertilized with phosphate, however, the cotton plants had good vigorous growth and healthy color and there was no evidence of root rot.

The treated part of the plot yielded at the rate of 368 pounds more of seed cotton an acre than the part not benefiting from clover or fertilizer.

Since then Koehler has been a generous user of annual yellow-blossom clover. He further helps his land by rotating corn and cotton with the cover and soil-improving crops.

Koehler was highly pleased when he applied his test-plot findings to a 20-acre field and got three-quarters of a bale of cotton an acre in 1947, a better yield than he obtained on the plot. And last year he did even better. He harvested 17 bales of cotton from 19 acres that had been conditioned with yellow-blossom clover and treated with 300 pounds of phosphate, the clover having been turned into the surface of the soil in March.

"I used to average a quarter of a bale an acre before I worked out this conservation plan with help from the Soil Conservation Service fellows," Koehler commented. "A third of a bale used to be a big crop."

Acre yields of other crops on the Koehler farm have also increased greatly under his conservation plan. For example, flax has doubled in yield from 6 to 12 bushels an acre.

Out of his higher income, Koehler has bought a combination grain and fertilizer drill for planting soil-improving cover crops of legumes on his and his neighbors' farms. He has also bought a combine for harvesting legume seed for himself and his neighbors.

Koehler is not hesitant in giving full credit to his soil conservation plan for controlling the erosion that was eating his farm away and for restoring the productiveness that has been boosting per-acre crop yields and increasing the value of his land. And he doesn't mind paying Federal income taxes. In fact he's quite happy about it.

SOIL AND WATER LOSSES REDUCED BY IMPROVED FERTILITY

By DWIGHT D. SMITH

THAT soil fertility has a very significant effect on runoff and soil erosion has been shown by experiments conducted at the Midwest Claypan Soil Conservation Experiment Farm near McCredie, Mo., a cooperative research and development project of the Soil Conservation Service, United States Department of Agriculture and the Missouri Agricultural Experiment Station. The results emphasize the fact that an infertile soil is an erodible soil. They show how production can be tripled and at the same time field erosion reduced over 90 percent. This is accomplished not by one but by several important practices. They are: (1) crop rotations that include grasses and legumes, (2) return of crop residues to the soil, (3) contour farming with terracing as the magnitude of slopes dictates, and (4) scientific application of commercial fertilizers. These claypan soils inherently low in fertility have thus been improved to the extent that their performance is approaching that of the better soils of the State.

The erosion process involves a balance of forces. Raindrops falling through the atmosphere have mass and velocity, and hence possess energy. When they strike the surface of the earth and explode like miniature bombs, their kinetic energy is expended. This energy in the rainfall of a normal growing season on one acre is more than that required to plow, plant, cultivate, and harvest an acre of corn. Rainfall not absorbed by the soil acquires additional energy, enabling it to carry soil as it flows down the slope to the field drainageways.

Vegetation is the most effective medium to resist the erosive force of the rainfall. Vegetation, either living or as crop residue, absorbs the energy of impact of the falling raindrop to reduce or eliminate splash erosion. If it is grasses and clovers, the soil is conditioned to resist the erosive forces of the raindrops during the period between seedbed preparation and the development of a protective cover by a new crop.

The growth of the crop and its ability to provide (1) soil-cover protection and (2) soil conditioning are, of course, dependent largely upon the fertility of the soil. There is a third important means of reducing erosion that is directly related to soil fertility. It results from the fewer acres of grain crops, under which erosion normally occurs, that are required for production of a given amount of

NOTE.—The author is research project supervisor, U. S. Department of Agriculture, Soil Conservation Service; and research associate, Soils Department, University of Missouri.

The oats crop on the Putnam soil requires fertilizer for high yields and erosion control. Above: Oats in 2-year rotation with corn, but without soil treatment. Below: Same basic rotation but with lime and with sweetclover as a green-manure crop before the corn, and with 200 pounds per acre of 10–20–20 fertilizer on the oats and corn. Midwest Claypan Soil Conservation Experiment Farm, McCredie, Mo.

grain when yields are high. This acreage, no longer required for production of grain, may then be seeded to perennial grass and legume pastures, under which erosion will be negligible.

Fertilizer has its greatest effect on runoff and erosion under the small grains because of directly associated cover differences. The fertility treatments are of increasing importance as the soils are poorer from whatever cause, whether natural or through depletion from erosion and cropping.

Unfertilized wheat has developed much more slowly and has suffered greater winter killing than fertilized wheat on comparable plots in the same cropping system at McCredie. This difference in cover, during the 9-month period from seeding to harvest, resulting from the use of 200 pounds per acre of 0–20–10 fertilizer, has reduced runoff 16 percent and soil loss 42 percent. These results (table 1) are averages for four seasons.

TABLE 1.—*Effect of 200 pounds per acre of 0-20-10 fertilizer on runoff and erosion under wheat from Oct. 9 to June 29. Average for 4 crop seasons during the period 1943-46*

[Putnam silt loam plots: 3-percent slope: 26.51 inches average rainfall]

	Unfertilized plot	Fertilized plot
Runoff.....inches..	9.72	8.15
Soil loss per acre.....tons..	4.31	2.52
Yield per acre.....bushels..	8.4	20.9

The difference in wheat yield, at present prices, shows a return of $23.50 for $5.26 invested in the fertilizer, or a return of $4.50 per dollar invested.

With oats, the difference in favor of an N–P–K fertilizer has been even more striking. These data were secured during a 3-year period of relatively light erosion following 6 years of similar cropping and treatment, or lack of treatment in the case of the unfertilized rotation (table 2). No other result could be expected when one considers the difference in cover (fig. 1) of the fertilized and unfertilized oats 6 weeks after planting.

TABLE 2.—*Effect of 200 pounds per acre of 10-20-20 fertilizer on runoff and erosion under oats from Apr. 19 to July 9. Average for crop seasons during 1947, 1948, and 1949*

[Putnam silt loam plots: 3-percent slope: 10.95 inches average rainfall—3.57 inches below 9-year average]

	Unfertilized plot	Fertilized plot
Runoff.....inches..	2.39	0.24
Soil loss per acre.....tons..	1.18	.07
Yield per acre.....bushels..	6.6	27.1

Crop residues have furnished effective winter cover protection. Corn stalks left on the soil in contrast to corn stalks removed have reduced erosion by about one-half from late September to oat-seeding time the next spring.

When vigorous stands of grass and legumes are plowed under before corn, the erosion under the corn has been reduced to one-fourth of that under corn not preceded by the soil-conditioning crops. Fertilizers have been required to produce the quality of grass and legumes necessary for maximum soil conditioning. The more vigorous stand of meadow provides a greater root system to hold the soil together and also returns a larger amount of top growth when plowed. The soil aggregates following the meadow crop have an improved stability. There is a greater proportion of the larger soil particles. Larger aggregates are, of course,

less easily carried from the field by the runoff water. Sweetclover as a green manure has been very effective in soil conditioning, but not to the same extent as grass and legume sod (table 3).

TABLE 3.—*Nine-year average runoff and soil loss, Apr. 27 to Oct. 8, and 4-year average aggregation and organic matter under corn preceded by different soil-conditioning crops*

[Putnam soil loam plots: 3-percent slope: 24:11 inches average rainfall]

	Corn following—		
	Oats	Sweetclover under	2 years grass and legume meadow
Runoff ..... inches..	6.06	4.68	3.79
Soil loss per acre ..... tons..	7.72	3.38	1.81
Aggregate size ≧ 1 mm.[1] ..... percent..	31	28	43
Relative aggregate stability [2] ..... do....	64	61	79
Organic matter ..... do....	2.67	2.64	2.83

[1] Average of samples secured, 1944–47.

[2] Amount stable under wet sieving as percent of amount stable under dry sieving.

Adequate soil fertility treatments according to soil needs are particularly important on these low fertility claypan soils if the erosion-control advantages of several years of grass and legume meadow in a rotation are to be secured. Soil loss under corn following 4 years of meadow averaged 41 percent greater than under corn following 1 year of meadow during the initial 6-year period of study when only 200 pounds per acre of 0–20–10 fertilizer was used on the small grain of the rotation. During the following 3-year period, in which nearly adequate amounts of N–P–K fertilizer were used on all crops, the soil loss under corn following 4 years of meadow was 21 percent less than that following 1 year of meadow. Adequate soil treatments have made the long meadow rotations more effective from an erosion-control standpoint and highly desirable from a farming and production standpoint.

If a farmer on the Putnam soil wished to produce approximately 1,500 bushels of corn equivalent each year and used a corn-oats rotation without soil treatment, he would require 100 crop acres according to the 9-year average yields for this system at McCredie. The 50 acres of corn at the 9-year average yield of 23.2 bushels per acre would produce 1,160 bushels. The 50 acres of oats at the average yield of 15.2 bushels would produce 760 bushels of oats, or in terms of corn equivalent, 357 bushels; or a total of 1,517 bushels of corn equivalent from the 100 crop acres. Erosion, if the fields were of 3 percent slope, the same as the McCredie plots, and were farmed up and down hill, would carry away an average of more than 18 tons of soil per acre annually. If the farmer changed the system to corn-oats and sweetclover with adequate soil treatments, he could reduce the grain acreage by two-thirds and produce a corn equivalent of 1,522 bushels. The remaining 67 acres could be returned to permanent grass and legume pasture which would produce beef, based on the McCredie pasture returns, equivalent to 42.6 bushels of corn per acre. Total production from the 100 acres would average about 44 bushels of corn equivalent per acre, or three times that of the original system. Erosion on the 33 cultivated acres would average about 10 tons per acre, but if terraced and contour-farmed, erosion would be reduced to less than 1 ton of soil loss per acre. With the remainder of the field in a permanent grass legume pasture, erosion for the 100 acres would result in an average soil loss of less than 1 ton per acre annually.

Numerous other systems could be used, according to the land and the farmer's needs; for instance, a 4-year rotation of corn-wheat-2 years of meadow. This system would leave 34 acres for permanent pasture. Based on average McCredie yields the last 3 years, when nearly adequate soil treatments were used, production would also average 44 bushels of corn equivalent per acre from the 100 acres. Erosion from the 66 crop acres would carry off less than 2 tons of soil per acre if contour-farmed without terracing; hence, adequate erosion control for the 100 acres would be attained. A more practical system for the claypan-soils area where the fields are generally fairly uniform would be a 6-year rotation of corn-wheat-4 years of grass and legume meadow or pasture. Average crop yields would again be 44 bushels of corn equivalent per acre. Erosion on the 100 acres with only contour farming would run less than 1½ tons per acre annually, well within the limit for practical maintenance of productivity and at the least cost for conservation practices. Table 4 summarizes the production and erosion computations for the four systems.

The effects of soil cover and soil conditioning on erosion losses are, of course, a part of the systems here discussed. Soil treatments to make the reduction in erosion and the increase in production possible are not too expensive, especially when one considers the results. They will average up to

$10 per acre annually for the 100 acres during the first 6 years. The treatments used included lime and rock phosphate as base treatments on both crop and pasture land. Ammonium nitrate was plowed under before corn, and for the small grain it was used before and after drilling. An N-P-K starter fertilizer was used with both the corn and wheat, on the third-year meadow, and on the pasture. After the first round of the rotation, some reduction may be possible. Constant use would undoubtedly result in higher yields than appear in the calculations, as these yields were secured during the first 3 years after the treatments were begun.

These results should present a challenge to a farm operator as to what may be possible on the lower-fertility soils. It will require careful management and working capital, although the investment in land should be less than on the soils of higher natural fertility.

TABLE 4.—*Field erosion and production for 4 cropping systems, calculated from plots*

[Putnam silt loam plots: 3-percent average slope]

	Rotations			
	Corn-oats	Corn-oats and sweet-clover	Corn-wheat—2 years meadow	Corn-wheat—4 years meadow [1]
Field soil loss per acre:				
Up and down hill [2] ....tons..	18	10	3.4	2.6
Contour farmed [3] ....do....	.....	5.4	1.8	1.4
Terraced and contour farmed..do....	.....	.9	.3	.2
Area:				
In crops ....acres..	100	33	66	100
Seeded to permanent pasture..do....	0	67	34	0
Total ....do....	100	100	100	100
Yields per acre:				
Corn ....bushels..	23.2	79.5	82.5	82.5
Small grain ....do....	15.2	27.1	17.7	17.7
Meadow ....tons..	.....	.....	2.2	2.2
Pasture (grass and legumes) pounds of beef..	.....	266	266	266
Corn equivalent:				
Cropland [4] ....bushels..	1,517	1,522	2,974	3,005
Pasture ....do....	.....	2,852	1,447	1,419
Total ....do....	1,517	4,374	4,421	4,424
Yield per acre	15.2	43.7	44.2	44.2

[1] 2 years hay and 2 years pasture.

[2] 2.7 times measured plot losses. Field slope length is 5 times plot length.

[3] 54 percent of up-and-down-hill losses.

[4] Corn equivalent of oats is 0.47 times number of bushels. Corn equivalent of wheat is 1.15 times number of bushels. Corn equivalent of hay is 17.6 times number of tons. Corn equivalent of pasture is 0.16 times pounds beef.

HIS TREES HAVE ROOM TO GROW

By J. M. CASE

Timber on the Arl Hildebrand farm was marked and selectively cut in 1940. In 1945 it was selectively cut for sawlogs. It was cut again in 1950. Yields have totaled $100 per acre since 1939. Seven thousand board feet per acre remain on the tract at present, as against 3,000 board feet before proper management.

IN Nevada County, Ark., there's a farmer known thereabouts as the "daddy of farm forestry." He's Arl Hildebrand, whose 8-acre woodland reflects sound forestry and profitable woodland improvement.

Three selective cuttings, at 5-year intervals,

NOTE.—The author is forester, Soil Conservation Service, Hope, Ark.

have yielded Hildebrand a net return of $800. And the volume of standing timber today is more than double what it was before his first cut in 1940.

The woodland, in 1940, was typical of many southern farm forests. It was dense, old-field pine, 30 years old, stagnated at a tree diameter of 9 inches with about 3,000 board feet to the acre. A clear cut would have netted Hildebrand about $300. This sounded like a lot of money for a crop that just grew up by itself with no special care.

Hildebrand hesitated about selling outright. He figured it would take another 30 years to grow the same crop again. He talked to SCS technicians assigned to the newly organized Terre Rouge-Bodcaw Soil Conservation District. They told him about 5-year cutting cycles and selection of trees to be cut, leaving the better trees with space for growth. A local lumber company advocated the same type of management and practiced it on its own land. Hildebrand decided to try this new idea. He has never been sorry he did.

The stand was marked and cut in 1940, 1945, and 1950. Each time the better trees were left with space enough to grow but no space wasted. Sawlogs have been the principal crop. Pulpwood was salvaged from the tops and from smaller trees.

The trees now average 13 inches in diameter at cutting time and the woodland has about 7,000 board feet on each acre, compared with 3,000 in 1940. In the 10-year period Hildebrand has harvested $100 worth of products off each acre. He has added another $120 per acre capital stock—the increase in growth his trees have made since he started improving his woodland. This means that his woodland has been producing $22 an acre annually.

Hildebrand didn't earn his title "daddy of farm forestry" solely as a result of his management record. He has explained the value of woodland improvement at every opportunity. Visitors are always welcome and he usually goes with them to look at his trees. Hardly a week has passed since 1945 that conservationists and foresters have not brought farmers and timber owners to see what timber improvement has accomplished on the farm. The woodland was a feature of a recent tour sponsored by the Prescott Chamber of Commerce.

Nevada County has staked a claim to the title "forestry capital" of Arkansas, and it is men like Arl Hildebrand who are helping to make the claim stick.

AIRPLANE SEEDING OF SAND LOVEGRASS

By A. J. LONGLEY and M. D. ATKINS

EXPERIENCES of soil conservation districts and the Soil Conservation Service with sand lovegrass on the dunes of southwestern Kansas indicate that the airplane offers a solution to the problem of revegetating land that, to all practical purposes, can't be seeded to adapted grasses any other way. It promises a way to substitute better forage plants for the present stand of sagebrush and weedy grasses on this land where present grazing capacity is low.

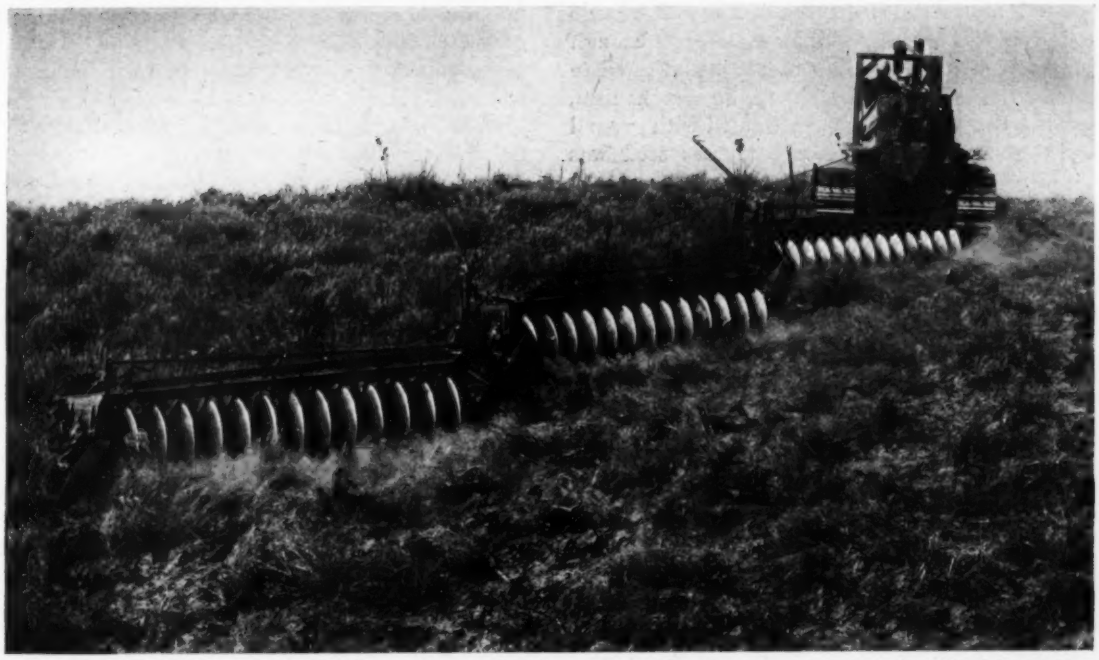
Airplane seeding in this area got its start in 1947 when Chet Reeve, cooperating with the Finney County Soil Conservation District, seeded 800 acres of his 6,000-acre ranch with sand lovegrass by plane. In 1949 cooperators with the Finney County, Stanton County, and Seward County Soil Conservation Districts seeded 7,400 acres to sand lovegrass from the air. Seedings this year are more extensive.

Results are less than one gets from drilling grass seed, but they are encouraging. Some fair stands of sand lovegrass were obtained, and seeding costs were low enough to make revegetation practical by this method of seeding.

The seeding problem is faced on several hundred thousand acres. Predominantly sand, the soil is droughty and very subject to wind erosion. Native vegetation has been depleted, succeeded by a cover of sagebrush, weedy grasses and forbs of low feed value but capable of keeping the soil in place. These lands are still grazed, however, and ranchers want to improve both the protective cover and the quality of forage.

Seeding with ground equipment has proved successful, of course, but is excessively expensive and discouragingly slow. A crawler-type tractor is needed to pull equipment. Much of the surface is so irregular that it is hard to keep a drill in the ground. Susceptibility to wind erosion makes it inadvisable to destroy the present cover except in the better-protected low areas. These

Note.—The authors are district conservationist, Soil Conservation Service, Garden City, Kans.; and observational nurseryman, Soil Conservation Service, Manhattan, Kans.



This equipment is being used by the Finney County Soil Conservation District to prepare sand-dune land for seeding by airplane. Eighty to ninety percent of the sagebrush, yucca, sand dropseed, and annual weeds are destroyed by this method when it is done in proper season. Only the more nearly level land and the lower dunes and ridges are treated this way because of the danger of wind erosion should the cover on the more exposed places be destroyed. The district furnished equipment and operator at $1.50 per acre.

things sent ranchers and Soil Conservation Service men casting about for a faster, cheaper way of seeding.

Grass seeding by airplane is not new. But there is little data to indicate what results to expect under conditions such as those in southwestern Kansas. Nearly all seeding done in recent years in this High Plains area had been with conventional equipment.

Beginning in 1939, the Soil Conservation Service compared drilled seeding, broadcast seeding covered with a disc harrow, and broadcast seeding not covered. While stands from drilled and covered broadcast seedings were generally far superior, it was noted that the very-small-seeded sand lovegrass established stands when the seed was simply broadcast on the sandy land without any effort being made to cover it. This led to the use of airplanes.

The first seeding by Chet Reeve didn't turn out exceeding well. It was made too late in spring, but since moisture conditions continued ideal for several weeks a fair stand of sand-lovegrass seedlings emerged. Grasshoppers added to plant competition. Most of the sand-lovegrass plants failed to survive the first growing season. Those that could be found by late summer had been eaten to the ground by the grasshoppers.

With sand-lovegrass seed costing $3.50 to $5 a pound, no airplane seeding was done in 1948. Farmers in the area were getting into seed production on their own, however. Sand-lovegrass seed became more plentiful and the price fell to $1 to $1.50 a pound. Eight ranchers cooperating with the Finney, Seward, and Stanton districts gave airplane seeding another trial, seeding 7,400 acres between February 16 and April 15, 1949.

These seedings were contracted to a commercial crop-dusting and aerial-seeding concern which used small trainer planes, at an average rate of 50 cents an acre. The only addition to the plane's crop-duster hopper and mechanism was an agitator and 12-inch propeller to drive it. The ranchers supplied seed, other material, and the services of flagmen.

First attempts indicated the need for a filler to add bulk to the sand lovegrass for better control of the rate of seeding. It was found that

ground milo mixed at the rate of 2 pounds of milo per pound of sand-lovegrass seed gave enough bulk to enable the seeding rate to be adjusted to 1 pound of seed an acre. The feeding mechanism, it was discovered, could be calibrated with ground milo alone before the sand-lovegrass seed was added.

A calm day is best for such seeding, but there is nearly always some wind in southwestern Kansas. A flight across the wind proved most satisfactory. The plane crossed the area to be seeded at 80-foot intervals. Flight elevation varied, depending on the topography of the land, but usually was less than 20 feet above the ground.

A check on one of the first fields planted showed 36 seeds per square foot at a point 20 feet out from the center of the plane, 18 seeds 30 feet out, and only 3 seeds per square foot at 40 feet out or at the outer edge of the flight strip. This indicates that flying narrower strips, or overlapping strips about 10 feet, is advisable.

Generally, there was no seedbed or ground preparation before seeding, and no effort was made to cover the seed. However, Reeve, who was making his second attempt, worked 160 acres of sagebrush range land and 80 acres of abandoned cropland with a one-way plow before seeding. The discs were run at a shallow depth to cut off sagebrush clumps and many of the sand dropseed and other weedy grass plants.

This operation was confined to the swales and lower dunes because of the acute danger of soil blowing. Every effort was made to leave all plant residues and litter on the surface. The few deep-rooted plants, such as sandhill bluestem, remaining in these range lands, were not damaged seriously.

Each of the 1949 plantings was examined carefully in June and October. Full results are not known yet, because many of the sand-lovegrass seeds do not germinate the first year. Stands varied widely but by far the best were on land that had been one-wayed before seeding. The earlier seedings showed up better than the late ones. One-waying apparently reduced competition for moisture by killing weeds and also made it more likely that the seed got covered.

John Burnside in Finney County seeded 500 pounds of sand lovegrass on 640 acres of depleted range land February 16 and 17, 1949, while there was still snow on the ground. A good stand of seedlings emerged, even though there had been no tillage, and a fair stand survived at the end of the season. His pastures, however, do not have a heavy growth of sagebrush nor thick stands of weeds.

Chet Reeve made his planting early, February 20. He obtained a good stand of sand lovegrass on the one-wayed land, but a much poorer stand on the land that had not been tilled.

On the other hand, April seedings on land that had not been tilled in the Ralph Beach and Son ranch in Finney County, and in the C. M. Light, Jr., and J. E. Alexander ranches in Seward County produced very poor stands among the thick growth of sagebrush and weedy plants.

Because of the results in 1949 the board of supervisors of the Finney County Soil Conservation District borrowed three one-way plows to use with the crawler-type tractor they have on loan from the Soil Conservation Service. After trials they bought three such plows and are providing an operator and the equipment for tilling this rough sand-hill land at the rate of $1.50 an acre. Two thousand acres were tilled with this equipment in the fall of 1949 for winter and spring seeding in 1950. Also, during the past winter, SCS seeded 2,000 acres of the land it manages in the Morton County Land Utilization project.

Many ranchers are now convinced that they can go ahead with reasonable assurance with airplane seeding. Attention is now being turned to the possibilities of seeding some of the bulkier grass seeds, so that a desirable mixture may be obtained with the sand lovegrass.

Substitution of a cover that is made up predominantly of high-quality forage plants for the present sagebrush-weedy-grass cover will more nearly assure continued use of this land for livestock production. It may even cause some of the nearby highly erosible cropland to be seeded down. Experience on the LU project and of soil conservation district cooperators indicates that such seeding can increase grazing capacity considerably and at the same time assist in erosion control.

VETS VISITED.—Departing from custom, the Harrison County (Mo.) Soil District Supervisors held a meeting with a group of GI farm trainees right out in the trainees' own community. They met at Ridgeway High School to review farm plans which the group had made for their own farms with the help of Farm Planner John Gibson.

Fourteen veterans were present. Their farm plans bring to 42 the number that have been developed for men enrolled in the on-the-job training program.

GRASS MAGIC

(Continued from p. 250)

after combining to smother the new seedlings. It also stops erosion and saves moisture. Two years ago he harvested $1,250 worth of seed from 10 acres of blow-sand that cost him $7 an acre. "Fertilize early—in February or March—for the best seed yield," he says. "Fertilizing too late even cuts down the yield sometimes."

All of these men warn against overgrazing. "Take care of your stand," says Harvey Harris. "It pays. A good stand of planted grass, well managed, will produce five times as much cattle gain as the native grasses, year after year. For the last 4 years, our crested wheat pastures have averaged 155 pounds of gain per acre as against 33 pounds from our best native grasses." One should leave enough litter and stubble to maintain the plants, prevent erosion, and conserve moisture.

Northeastern Colorado farmers turn the bulk of their grass into beef, though all have milk cows and a few run sheep. Bill Oliver says crested wheat makes prime hog pasture.

The best dollars-and-cents recommendation for this new kind of farming is that farmers who first planted grass only to rebuild ruined land are now planting it also on their best ground because it out-pays other crops. They hoped, at first, to get their grassland back into cultivation as soon as possible, but none has been plowed up yet. When it is plowed up, they will have better-than-virgin soil.

For years northeastern Colorado people have been living the kind of family and community life that pays off in the sustained yield production of human satisfaction, character, and social good. Now, at last, they've learned a kind of farming to match, that's paying off in the sustained yield production of crops and livestock without destruction of their means of life—the only kind of farming justifiable anywhere.

REVIEWS

FOREVER THE LAND. Edited and illustrated by Russell and Kate Lord. Harper and Brothers. New York. 1950. 394 pages.

This book, a country chronicle and anthology, by Russell and Kate Lord, is probably the best single moving account yet written on the way the American people belatedly turned their attention to the improved care and use of soil and water.

It chronicles the determination and action of a small group of leaders, meeting in Washington in March 1940, to establish a Society to be known as Friends of the Land. It shows how this movement took root and grew despite blazing guns in Europe, and despite America's entry into the greatest war in history. It shows the early struggle to provide a sound underpinning for *The Land*, the Society's quarterly magazine which is now firmly established among the best periodicals in the country.

It further shows that from the beginning neither the organization of Friends of the Land, nor the quarterly which it sponsors, has followed a fixed or rigid formula. Chapters of the Society have been formed in such small rural county-seat towns as Mount Gilead, Ohio, as well as in metropolitan centers such as New York, St. Louis, Chicago, Cleveland, and Atlanta. Similarly, the book includes relatively obscure writers who have a message, as well as a Pulitzer prize winner like Louis Bromfield, or a world authority on conservation such as Hugh Bennett. The Society, through its organization, its publication, and meetings, has been a powerful influence in bringing city folks to a real understanding about their dependence on the good earth.

Backed by 30 years of interviewing, reporting, and writing, Russell Lord has no peer in interpreting the thoughts and feelings of country folk or the occupants of 40-story skyscrapers who vaguely sense that all is not well unless they get their feet on solid ground.

Readers, of course, will disagree on the merit of articles in the anthology. Some will vote for Jonathan Daniels' story about Hugh Bennett. Others will claim first priority for "Marvels at Our Feet" by Liberty Hyde Bailey, or "Dust in The eyes of Science" by Paul Sears.

All will agree, I believe, that Lord has selected the various articles and poems with appropriate discrimination and taste.

The make-up, typography, and illustrations combine to make the book particularly striking and unique. While Kate Lord's achievements as an illustrator are already well known, she reaches even greater heights of excellence in "Forever the Land." Her full-page illustrations, and others, are charming and reverent.

—GLENN K. RULE.

FARM WOOD CROPS. By John F. Preston. McGraw-Hill. New York. 1949. 302 pp. Illustrated. $3.75.

"The purpose of this book is to present a technical guide to the development of a farm woodland enterprise integrated with the farm business . . . Farm forestry is a farm activity on the forest land that is included within the farm boundaries. It is primarily a farm problem—one of utilizing farm labor in woods work and forest products in the farm business."

To a person not a college-trained forester these quotations, from the preface of "Farm Wood Crops," are mere statements of purpose or definitions. No hackles are raised. The professional forester, however, will recognize them as something new and different in an approach to the teaching of farm forestry.

Many foresters never get out of the woods; many others who do go directly from there to the classroom. John Preston spent much of the last decade of his active career trying to get general acceptance of the simple fact that farm forestry is primarily "utilizing farm labor in the woods, and forest products in the farm business." He did not wholly succeed. Too many of his professional colleagues still avoid the manure pile; their thinking starts with trees that are being trampled by the cows, or with the board feet and vigor of marketable timber. "Leave farming to the farmers," they say, "we are foresters."

Preston's book will help get foresters and farmers together. That probably is why he wrote it. He recognized that there is no text available to forestry schools or agricultural colleges that takes forestry out of the woods and puts it on the farm.

Technically, the author attempted a tremendous job. In three chapters, 9, 10, and 11, comprising 100 pages, he has covered the strictly technical forestry material intended for application over the entire United States. These chapters are well illustrated (as contrasted with the balance of the book) and give the reader a good concept of cultural practices, protection, and planting and harvesting the farm woods crop. Depending on one's point of view, this brief coverage is either good or bad; good if one desires simplification and is satisfied with a general approach; bad if one wants to get into technical forestry as it applies to problems in the woodland of a given locality.

And right there is where this excellent presentation of forestry, as applicable to farming, may fail to get acceptance by educational institutions. Farm forestry is taught by foresters who generally are not in accord with a philosophy which says, "integrated farm forestry can best be promoted . . . by non-forestry-trained agricultural teachers and farm leaders." The few who do accept Preston's thesis will still want a text on "First Aid" in forestry, or what to do with an injured piece of woods or sick land in need of forestry treatment.

Preston has expressed a philosophy that needs universal acceptance before farm forestry can make much progress. He has done it well. Unfortunately, however, philosophical texts are not best sellers.

Lest there be a question as to the reviewer's personal appraisal of this publication, let the record show that he picked up several new and valuable ideas to use in his everyday job of getting agricultural workers acquainted with the farm woods. He strongly recommends it to others in similar positions.

—STANLEY S. LOCKE.

NOTES FROM THE DISTRICTS

INDUSTRY IS A PARTNER.—The 1949 report of the Knox County (Ind.) Soil Conservation District was paid for by advertising space purchased by farm contractors. The $520 revenue covered all the cost of printing and mailing 3,000 copies.

Contractors met with the supervisors to learn technical standards and the type of equipment needed. The supervisors invited the contractors to participate in demonstrations. The result has been more support for the soil conservation program.

"Actually a revolution is taking place in this district," says the report. "We have faith in the soil. It produces new wealth by which we can purchase the products of labor and industry."

THE CONTOUR LINES LAST.—Chemical sprays make it possible to increase conservation production per man, according to Harold A. Rothgeb, work unit conservationist at Hays, Kans.

Without some such device as spraying, Rothgeb points out, laying out the lines for terraces and other conservation measures can generally be done only during the short time between harvest and seeding time. Use of the chemical makes it possible to distribute the work load more advantageously and at the same time permit layout to be done during a longer period of the year and more economically because of better weather conditions.

Of course, some lay-out has been done and lines marked through wheat with a single-row lister, chisel, or other tillage tool. But the farmer objects to this. It makes combining a rough job with the high-speed machines now used. And in addition, it is slower than with chemical, Rothgeb says.

Sodium salt of trichloroacetic acid, commonly known as TCA, is used at the rate of 3 pounds of chemical and 3 gallons of water a mile. At 30 cents a pound for the chemical, the cost of material for marking lines a foot wide is less than $1 per mile.

Other information can also be shown by the use of chemicals, such as marking arrows to show the direction water should be made to flow and other symbols to denote construction features for the information of contractors.

CONGRATULATIONS!—The newly formed Idaho State Soil Conservation Auxiliary is one of the first of its kind in the United States. This auxiliary was formed during the Idaho Soil Conservation District Supervisors Convention in Lewiston last November.

The auxiliary had its beginning in Weiser during the Idaho Soil Conservation District Supervisors Convention in 1948. There the women from the Lewis Soil Conservation District formed an auxiliary in order to prepare for the 1949 convention which was to take place in Lewiston. So much good work was done by the ladies that Milton Branch suggested that an auxiliary be formed for the whole State.

Mrs. Glenn Henderson of Nez Perce was elected president. The State was divided into several areas, each with a vice president and an adviser.

Mrs. Henderson says that the goal of the newly formed auxiliary is the promotion of soil conservation in the State. "I wish to have an informed group of women who through various women's groups and organizations can educate the public in soil conservation."

GRAZING SEASON EXTENDED.—Dick Burney, Jr., cooperator with the Copiah County (Miss.) Soil Conservation District, planted 3 acres of Class IV land to kudzu

about 10 years ago. It has furnished lots of good grazing during the late summer for the past 6 or 7 years. But Burney was not satisfied with 8 to 10 weeks' grazing each year, so he sowed reseeding crimson clover on the kudzu last fall. He had a luxuriant growth of winter grazing all last winter, which he said was better than he had on his Class II bottom land. Visitors stop by nearly every day to ask about the green carpet on that old rough hill, Burney reports.

GOOD WORK REWARDED.—The "Nail It Down Club" was born in Pullman, Wash., February 23, 1950, reports Frank Carothers, president. The new club, sponsored by the South Palouse Soil Conservation District, was created to foster conservation and to recognize outstanding contributions in the field of conservation. The club began to function immediately in a series of weekly radio programs the South Palouse Soil Conservation District is sponsoring on a local radio station.

At each weekly program, six in all, a farmer will be selected by the board of supervisors for some outstanding practice or accomplishment in soil conservation. He will be presented a certificate of membership in the new club, as well as a small token of appreciation provided by the local water-power company.

Charter members are Floyd Barkhuff, John Heitstuman, Bennie F. Druffel, Glen Kimble, Frank Carothers, Roscoe Cox, Troy Lindley, Pete Dacres, Rich Bakes, Clarence Hill, Mark E. Hill, Dr. Gordon McCloskey, and Henry Bongiorni.

TOP BILLING.—The *Poughkeepsie* (N. Y.) *New Yorker* put first-line emphasis on the importance of soil conservation recently when it inaugurated a newspicture telephoto service. As the first picture to come over its wires, it transmitted by special arrangements a photo of Kent Leavitt, then president of the National Association of Soil Conservation Districts, addressing the annual convention at Atlanta, Ga., and put it on page 1 of its February 27 issue. Leavitt's home is at Millbrook, close by Poughkeepsie. Soil conservation operations in Dutchess County district often are page 1 news in the *New Yorker*.

PACE SETTERS.—The Woodbury (Conn.) Rod and Gun Club is setting a stiff pace in soil and water conservation for other clubs in the Connecticut Wildlife Federation. Seventeen of its members are landowners who are cooperating with their local soil conservation district by improving their land with strip cropping, terracing, contour farming, drainage, diversion ditches, reforestation, and other erosion control practices and through wildlife management. In 1949 the club planted 1,462 Norway spruce, 910 hemlock, 1,175 red pine, 260 white pine, 906 multiflora rose, 153 high-bush cranberry, 109 bush honeysuckle, 416 privet, 35 grapevines, 31 flowering crab, and 14 elaeagnus. Five members grafted 157 scions of flowering crab. Five food patches were planted. The club sponsored a scholarship for the conservation workshop at the University of Connecticut and will sponsor another this year.

WELL-HEELED DISTRICT.—Clarence Reenders, chairman of the West Ottawa (Mich.) Soil Conservation District, recently astonished the Ottawa County board of supervisors by announcing that the district would not expect its customary annual appropriation. That's news in itself, but back of it is a story of good land use. Farmers in the district have learned to use tree land for trees.

The district operates its own nursery which supplies seedling trees to farmers at a nominal cost. About a million trees will be produced this spring. Farmers have planted more than 14 million trees in the county since 1939, largely on blown-out tracts and sandy land that formerly sold for a dollar an acre.

The operation of the nursery has put the district on a sound financial basis. Although erosion control was the primary purpose of the plantings, the sale of Christmas trees has proved an unexpectedly profitable side line. After thinning for this and other uses, good permanent stands of 200 to 300 trees are left.

DAUGHTERS OF THE SOIL.—The Freeborn County (Minn.) Soil Conservation District has a brand new organization. It's the Daughters of the Soil, women's auxiliary of the Soil Conservation Service and district personnel. Here are some of the things which the new auxiliary plans to do during the coming year: Hear Service people describe their work; review books on soil conservation; see motion pictures and slides; hear a talk on soil fertility and health; attend a supervisors' meeting; visit a soil conservation experiment station; make a tour of cooperators' farms. The members are considering attending the State soil conservation district supervisors conference and banquet in Minneapolis. Wives and daughters of district cooperators will be given an opportunity to join the organization.

WINNING SLOGANS.—"Conserve your soil now—don't wait. Tomorrow may be too late!" This was the prize-winning slogan selected from 175 entries in a slogan contest conducted over radio station WSDR, Sterling, Ill. Men, women, girls and boys, young and old alike, from both rural and urban areas, submitted entries.

Lee, Ogle, and Whiteside Soil Conservation Districts sponsored the contest in cooperation with the radio station. Two business firms in each district furnished prize money. Joe H. Folkers, Whiteside Soil Conservation District cooperator, of Sterling, coined the first-prize slogan, winning a $100 savings bond.

Second prize went to a school teacher, Mrs. Arlene Samson, of Dixon. Her slogan, "Planned land will time withstand," earned a $50 bond. Third prize, a $25 bond, was won by O. C. Holt, of Amboy, a vocational agricultural instructor, who wrote: "Our golden heritage—Guard it well. Use it wisely. Stop erosion." Fourth prize, $10 in cash, went to a high-school student: "Look to the future! Prepare for the future! Help save our soil." A housewife took fifth place ($8.75): "Don't deposit your soil with your neighbor. Keep it home—Bank on it yourself!"

Ten persons received honorable mention.

—WILLIAM BRIGGS.

S. W. Cosby, regional soil scientist, demonstrates how mapping case is used in field.

MAPPING MADE EASIER.—Soil conservation surveyors are going to have an easier job as the result of an ingenious invention by Fred Schlots of Yakima, Wash. The surveyors, who annually tramp over millions of acres of farm land, often work from large aerial photographs about 2 by 3 feet in size. In the field they put, directly on these maps, a variety of information about soil depth, erosion, land slope, and other conditions.

How to carry the photographs without damage and manage them in the field under all kinds of weather have long been knotty problems. Common practice has been to fasten the photos to pieces of plywood or mapping boards. This made a bulky load for the surveyor both in his car and in the field. During windy weather, it was difficult to carry the photos without being blown off course, and nearly impossible to write on them with the high degree of accuracy required. Rainy weather was the final curse. Surveyors had to add a waterproof cover for the photos and map board and even this was not enough to prevent damage since the cover had to be raised whenever information was added.

Surveyor Schlots, who has made conservation surveys of some 23,000,000 acres in Washington and Oregon, has solved practically all of the above difficulties by designing and building a cylindrical mapping case which consists of two aluminum tubes, one fitting inside the other. The inside tube, around which aerial photographs are wrapped, rotates freely on bearings at either end. There is ample clearance to prevent scraping against the outer tube. Schlots cut a rectangular window, 2 feet by 4 inches, in the outer tube. This affords ready access to the photograph inside and allows plenty of room for writing down survey information in the field. Since photos are wrapped tightly about the inside tube, surveyors have an excellent writing surface. Extra photographs are carried safe from the weather inside the hollow inner tube.

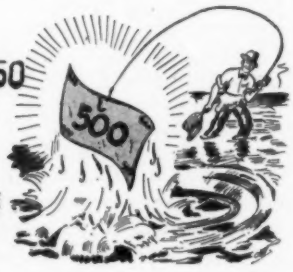
The entire case is fitted with a carrying strap as shown in the accompanying picture. During rain or snow, the case is carried in an upside down position to protect photographs from the weather. When it is necessary to write on the photo, Schlots has found that he can protect the small exposed area by turning his back to the rain or snow and shielding the mapping case with his body. Some surveyors using the case have added a plastic rain flap.

SPARKLING VICTORY FOR CLUB.—The $500 cash prize offered at the National Sportsmen's show in New York City for the establishment of the best conservation project by a sportsmen's club in 1949, has been won by the Sodus (N. Y.) Rod and Gun Club, a cooperator with the Wayne County Soil Conservation District. The complete conservation plan for 29 acres includes contour farming, cover cropping, crop residue management, strip cropping, tree and windbreak planting, diversions and drainage, and woodland management, protection, and improvement. The plan was made by Richard M. May, SCS zone conservationist at Upper Darby, Pa.

Fairfield Osborn, president of the New York Zoological Society, James Marron and Clayton B. Seagears, State directors of conservation in New Jersey and New York, respectively, were the judges.

The club was nominated for the award by Herbert Dibble, Newark, N. Y., a former president of the Wayne County Federation of Sportsmen's Clubs, who pointed to its activities in successful rearing of pheasants, construction of a large pond for propagation of wild waterfowl, its sending two boys each year to the State conservation camp, maintenance of clubhouse and grounds, building of skeet and trap fields, a fox-trapping campaign, and general enthusiastic support for all conservation measures.

Supporting the nomination were the endorsements of the Wayne County Grange, the Farm Bureau, the soil conservation district, outdoor writers for newspapers, the Northwest Conservation Club of Monroe County, and the Ontario County Federation of Sportsmen's Clubs. In a personal endorsement, Robert Perry, Rochester, N. Y., State district game manager, said the club is one of the most active and cooperative in western New York.



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